

## **ICT-PSP- proposal: Fall prevention through intelligent sensors and control systems**

Scope: Theme 3 regarding ICT Solutions for fall prevention and ICT and Ageing network.

Implementation measure: Pilot B - stimulating the uptake of innovative ICT based services and products

### The University of Agder (UiA) competences and advantages

- A state of the art lab facility for testing is located at the UiA. UiA is currently working on developing intelligent wearable sensors and smart home installations, intended for collection of data to be used in fall prevention systems.
- Security and privacy are important aspects in developing new ICT solutions for health care services. The UiA has broad scientific competence and active professors working with related projects for the health care sector.
- The UiA has, through local e-health projects, established computer network infrastructure as a simulated and secured national health network integrating hospitals, General Practitioners and the municipal health care services. The local municipalities have therefore built capacities and competence in using ICT in its service production. These networks could be used for testing of relevant systems and sensor technology as prototype test in realistic scenarios involving real users and with seamless integration and interoperability of different technologies, where user aspects and usability can be tested under controlled lab-test conditions.

### Motivation:

Falls of elderly people has huge economic and social cost for Europe. For example, the average number of falls of elderly in Norway per year is 10.000. The economic cost of these falls is 400 million Euros. Therefore, a vital challenge is to reduce the number of falls and thus reduce the implied economic costs for the society and the social cost of the elders. Intelligent sensors and control systems could prevent a substantial number of these falls by changing medication or putting other preventive measures in place. Sensor technology and software exist that can detect behavioral changes as an early indication of increased risk of falls. However, the sensor technology needs to be tested with suitable and effective software.

With the state of the art test facilities located at the University of Agder and the focus the Agder region has put on using ICT and intelligent sensors in the municipal healthcare provision, the region could be one of several areas for testing out new and improved systems.

### Aim:

Improve quality of life and care for the ageing population by providing independent living solutions with focus on fall prevention for elderly people through intelligent sensors and control systems.

The project will focus on the following aspects of fall prevention:

- Further development of intelligent pattern recognition systems in order to detect patterns of behavioral change as an early indication of increased risk of falls.
- Evaluation of combining information from several sensor system and learning automata, with a combination of processing data. These may foster sensors to interact and to allow other sensor data to, for example, control the lighting.

### Proposed project phases

1. Develop and test different types and combinations of sensors and software, and their ability to interact and to learn (self learning), i.e.:

- Carry out a wide validation of integrated, innovative ICT solutions supporting falls of elderly people in home settings (institutional settings may also be covered as an additional element).
  - Though ICT-based, the test should address how the proposed solutions could form part of wider comprehensive approaches to fall prevention and mitigation.
2. Test in relevant municipalities
- The solutions shall be tested in real life and a consolidated set of requirements and validated functional specifications should emerge as a result.
  - Present a credible methodology and pilot population for ensuring significance in the evidence of socio-economic impact, for example, by involving people who have already experienced falls, but sufficient measures should be taken to guarantee safety of the pilot participants.

Profile of preferred partners:

- State of the art testing facilities
- Software providers that can process sensor data from body-worn sensors and sensors in the home environment, preferably using IP and mobile smart-phone technology
- Developers of sensor technology
- Suppliers to the health care and home markets of similar products
- Active research and competence partners also being able to carry out field-test and user trials

For further questions, please contact:

Center of eHealth and Healthcare technology, University of Agder

Associate professor Rune Fensli

Tel: +47 3723 3000 Mob: +47 913 05 222

e-mail: [rune.fensli@uia.no](mailto:rune.fensli@uia.no)

or

Project manager Kristine Wikander

Tel: + 47 3723 3033, Mob: +47 9450 1351

e-mail: [kristine.wikander@uia.no](mailto:kristine.wikander@uia.no)